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**In the United States Patent and Trademark Office**

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Applicant: Craig F. Culver

Applicant's Ref: IMM059A

Application No: Unassigned

Filed: 6/5/01

Title: Tactile Feedback Interface Device

Including Display Screen (as amended)

Examiner: Unassigned

Group Art Unit: Unassigned

**PRELIMINARY AMENDMENT A**

Commissioner for Patents

Washington, D.C. 20231

Dear Sir:

Please amend the above identified patent application as follows before the examination of the application:

In the Title:

Please delete the Title and replace with: -- Tactile Feedback Interface Device Including Display Screen --.

## CLEAN VERSION OF AMENDMENTS

### In the Specification:

*Replace the paragraph starting on Page 1, line 10, with:*

This application is a continuation of U.S. Application No. 09/203,908, filed December 1, 1998, which claims priority to provisional applications no. 60/067,382, filed December 3, 1997 by Craig F. Culver, entitled "An Improved Multi-Function Control with Feedback," and no. 60/067,381, filed December 3, 1997 by Craig F. Culver, entitled "Interactive Panels for Instrument Control," all of which are incorporated herein by reference.

*Replace the paragraph starting on Page 3, line 6, with:*

More particularly, a control device of the present invention includes a housing and a carrier coupled to the housing and operative to move with respect to the housing in a first rotary degree of freedom. A first sensor senses the movement of the carrier and outputs a first control signal. A roller rotatably coupled to the carrier rotates with the carrier in the first degree of freedom and rotates independently of the carrier in a second rotary degree of freedom. A second sensor senses rotary motion of the roller and outputs a second control signal. Preferably, an arm member is coupled between the carrier and the housing, where the arm member pivots about an axis and where the first sensor senses rotation of the arm member. The roller rotates about an axis that is parallel to a plane of rotation of the arm member. The arm member can be positioned in the housing, where the housing includes an aperture through which the carrier and roller are accessible to a user of the control device. Preferably, a third sensor is also included to detect when the carrier has been pushed in a direction substantially orthogonal to a plane of rotation of the arm member.

### In the Claims:

A clean version of the pending claims are reproduced below. All pending claims are new, therefore no marked up version of the claims follows the Remarks section.

Please cancel claims 1-22 without prejudice.

23. (new) A handheld control device for interfacing with a host processor, said control device comprising:

a housing shaped to be held by a user;

a moveable user object engageable by a finger of the user and movable in at least one degree of freedom with respect to said housing;

a sensor operative to detect the motion of said user object in said degree of freedom;

an actuator operative to provide tactile feedback to said user of said handheld control device;

a local display screen mounted on said housing and separate from said host processor, said display screen operative to display textual information related to a program running on the host processor and to assist the user in using the control device; and

a wireless communication interface operative to transfer data from the control device to the host processor and from the host processor to the control device.

24. (new) A handheld control device as recited in claim 23 wherein said user manipulatable object is a roller.

25. (new) A handheld control device as recited in claim 24 wherein said roller can be pressed by said user to trigger an electrical signal output to said host processor.

26. (new) A handheld control device as recited in claim 24 wherein said roller is moveable in two degrees of freedom.

27. (new) A handheld control device as recited in claim 26 wherein said two degrees of freedom include a rotary degree of freedom and a translatory degree of freedom.

28. (new) A handheld control device as recited in claim 23 wherein said local display screen has a touch-sensitive surface.

29. (new) A handheld control device as recited in claim 23 further comprising a microphone for receiving voice commands from said user.

30. (new) A handheld control device as recited in claim 23 wherein said host processor is included in a video game console.

31. (new) A handheld control device as recited in claim 23 wherein said host processor is included in a personal computer.

32. (new) A handheld control device as recited in claim 23 wherein said host processor is included in a Web-access device.

33. (new) A handheld control device as recited in claim 23 wherein said host processor is included in a consumer electronic device.

34. (new) A handheld control device as recited in claim 23 further comprising a local processor, separate from said host processor and operative to communicate with said host processor, to read said sensor, to control said actuator to produce tactile sensations, and to control said local display screen.

35. (new) A handheld control device for interfacing with a host processor running a graphical application, said control device comprising:

a housing shaped to be held by a user;

a moveable user object engageable by a finger of the user and and movable in at least one degree of freedom with respect to said housing;

a sensor operative to detect the motion of said moveable user object in said degree of freedom;

an actuator operative to provide tactile feedback to said user of said handheld control device, said tactile feedback being coordinated with graphical images displayed by said host processor;

a local display screen mounted on said housing and separate from said host processor, said display screen operative to display information related to a program running on the host processor; and

a wireless communication interface operative to transfer data from the control device to the host processor and from the host processor to the control device.

36. (new) A handheld control device as recited in claim 35 wherein said user object is a roller.

37. (new) A handheld control device as recited in claim 36 wherein said roller can be pressed by said user to trigger an electrical signal output to said host processor.

38. (new) A handheld control device as recited in claim 36 wherein said roller is moveable in two degrees of freedom.

39. (new) A handheld control device as recited in claim 38 wherein said two degrees of freedom include a rotary degree of freedom and a translatory degree of freedom.

40. (new) A handheld control device as recited in claim 35 wherein said local display screen has a touch-sensitive surface.

41. (new) A handheld control device as recited in claim 35 further including a microphone for receiving voice commands from said user.

42. (new) A handheld control device as recited in claim 35 wherein said host processor is included in a video game console.

43. (new) A handheld control device as recited in claim 35 wherein said host processor is included in a personal computer.

44. (new) A handheld control device as recited in claim 35 wherein said host processor is included in a Web-access device.

45. (new) A handheld control device as recited in claim 35 further comprising a local processor separate from said host processor and operative to communicate with said host processor, to read said sensor, to control said actuator to produce tactile sensations, and to control said local display screen.

46. (new) A handheld control device for interfacing with a host processor running a graphical application and for controlling a cursor displayed within said graphical application, said control device comprising:

a housing shaped to be held by a user;

a moveable user object engageable by a finger of the user and moveable in at least two degrees of freedom with respect to said housing;

a sensor operative to detect the motion of said user object in said two degrees of freedom;

an actuator operative to provide tactile sensations to said user of said handheld control device, said tactile sensations coordinated with cursor interactions with graphical objects displayed by said host processor;

a local display screen mounted on said housing and separate from said host processor, said display screen operative to display textual information related to a program running on the host processor; and

a communication interface operative to transfer data from the control device to the host processor and from the host processor to the control device.

47. (new) A handheld control device as recited in claim 46 wherein said user object is a roller.

48. (new) A handheld control device as recited in claim 47 wherein said roller can be pressed by said user to trigger an electrical signal output to said host processor.

50. (new) A handheld control device as recited in claim 49 wherein said two degrees of freedom include a rotary degree of freedom and a translatory degree of freedom.

51. (new) A handheld control device as recited in claim 46 wherein said local display screen has a touch-sensitive surface.

52. (new) A handheld control device as recited in claim 46 further comprising a microphone for receiving voice commands from said user.

53. (new) A handheld control device as recited in claim 46 wherein said host processor is included in a video game console.

54. (new) A handheld control device as recited in claim 46 wherein said host processor is included in a personal computer.

55. (new) A handheld control device as recited in claim 46 wherein said host processor is included in a Web-access device.

56. (new) A handheld control device as recited in claim 46 further comprising a local processor separate from said host processor and operative to communicate with said host processor, to read said sensor, to control said actuator to produce tactile sensations, and to control said local display screen.

57. (new) A handheld control device as recited in claim 46 wherein said tactile sensations are coordinated so as to assist the user in navigating a menu displayed by said host processor.

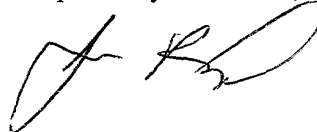
58. (new) A handheld control device as recited in claim 57 wherein said tactile sensations include bump sensations which are output when the cursor is moved from one element in said menu to another element in said menu.

## REMARKS

Claims 23-58 are pending in this application. Claims 1-22 have been cancelled, and new claims 23-58 have been added by this Preliminary Amendment. Minor updates have been made to the specification.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,



James R. Riegel  
Reg. 36,651

San Jose, California  
(408) 467-1900

MARKED-UP VERSION OF AMENDMENTS

In the Specification:

*Replace the paragraph starting on Page 1, line 10, with:*

This application is a continuation of U.S. Application No. 09/203,908, filed December 1, 1998, which claims priority [of] to provisional applications [serial] no. 60/067,382, filed December 3, 1997 by Craig F. Culver, entitled "An Improved Multi-Function Control with Feedback," and [serial] no. 60/067,381, filed December 3, 1997 by Craig F. Culver, entitled "Interactive Panels for Instrument Control," [both assigned to the assignee of the present application, and both] all of which are incorporated herein by reference.

*Replace the paragraph starting on Page 3, line 6, with:*

More particularly, a control device of the present invention includes a housing and a carrier coupled to the housing and operative to move with respect to the housing in a first rotary degree of freedom. A first sensor senses the movement of the carrier and outputs a first control signal. A roller rotatably coupled to the carrier rotates with the carrier in the first degree of freedom and rotates independently of the carrier in a second rotary degree of freedom. A second sensor senses rotary motion of the roller and outputs a second control signal. Preferably, an arm member is coupled between the carrier and the housing, where the [am] arm member pivots about an axis and where the first sensor senses rotation of the arm member. The roller rotates about an axis that is parallel to a plane of rotation of the arm member. The arm member can be positioned in the housing, where the housing includes an aperture through which the carrier and roller are accessible to a user of the control device. Preferably, a third sensor is also included to detect when the carrier has been pushed in a direction substantially orthogonal to a plane of rotation of the arm member.